Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Project 2 – Probability**

**Part 1: Basketball Statistics**

When a basketball player takes a shot, the player can have three possible outcomes: scores 2 points, scores 3 points, or misses the shot and scores 0 points. Suppose a given player takes 4 total shots in the first quarter of a game.

1. Draw a tree diagram that shows all of the possible outcomes for the 5 shots.
2. List the sample space.
3. What is the probability that the player makes exactly two 3-point shots?
4. What is the probability that the player makes at least two 3-point shots?
5. What is the probability that the player makes all four shots?
6. What is the probability that the player makes none of the shots?
7. What is the probability that the player makes the first two shots?
8. What is the probability that the player makes two 2-point shots and one 3-point shot?
9. What is the probability that the player makes exactly 2 shots?
10. What is the probability that the player makes at least 2 shots?

**Part 2: What are the chances of winning the lottery?**

Suppose you bought a lottery ticket where you chose 6 numbers from 1-49 to create your ticket**.** The order in which you select the numbers for your ticket matters. What are the chances of winning the lottery?

1. How many possible arrangements of 6-number tickets are there?
2. If you buy 1 ticket, what is the probability that you will win the lottery?
3. If you buy 100 tickets, each with a different combination of numbers, what is the probability that you will win the lottery? Write your answer as both a fraction and a percent.
4. If you buy 7 million tickets, each with a different combination of numbers, what is the probability that you will win the lottery? Write your answer as both a fraction and a percent.
5. In your opinion, is it worth it to play the lottery? Why or why not?